

As in the first volume, the illustrations both of the species and their structure are extremely good, though, unfortunately, the details are not quite so sharp and clear in some of them; the antennæ (in some cases), instead of terminating in a fine thread-like point, show a defined terminal button. The process by which the figures are produced is probably largely answerable for this tritling blemish.

When completed the present work will, without doubt, be the most satisfactory revision of the families and genera of the Lepidoptera Heterocera which has ever appeared, either in our own or any other language.

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Manual of Conchology, Structural and Systematic. With Illustrations of the Species. By GEORGE W. TRYON, JUN. Continuation by HENRY A. PILSBRY.—Vol. XIV. *Polyplacophora (Chitons)*. Philadelphia. 8vo. 1892-3.

THIS most important and useful work on systematic conchology was commenced in the year 1879 by the late G. W. Tryon. That author was responsible for the first nine volumes and part of the tenth and the first four volumes of the second series, descriptive of terrestrial mollusks. At his death in 1888 the work was continued by Mr. Pilsbry, and from that time has been proceeded with without interruption.

The present volume is devoted to an account of four families of Chitons, namely Lepidopleuridæ, Isechnochitonidæ, Chitonidæ, and Mopaliidæ, the two remaining families, the Acanthoelitidæ and Cryptoplacidæ, being reserved for the succeeding volume. This arrangement is to be regretted, as it will cause considerable inconvenience to have an Appendix and the Index to the entire group bound up in a separate volume.

The account of the Polyplacophora before us is by far the most important hitherto published, and, indeed, the only one which can pretend to anything like completeness. The introductory portion (pp. i-xxxiv) is devoted to a definition of the class, the description of the shell, the girdle, and the external features of the animal. Irregularities of growth and the collection and preservation of Chitons are also treated of, and the chapter concludes with an account of the progress in the study of these mollusks, the different classifications which have been proposed by Blainville, Guilding, Gray, H. and A. Adams, Shuttleworth, Middendorff, P. P. Carpenter, Dall, and Fischer, and the synopsis of the classification adopted by the Author, with an analytical key to the genera. The classification "is based mainly upon characters furnished by the articulating surfaces of the valves." In this connexion Mr. Pilsbry writes:—"The hard structure in this group is comparable to the vertebrate skeleton in the great variety of stresses to which it is subject. Each valve is not only acted upon by external forces and its body-muscles, but by the valves before and behind it and by the girdle.

Hard parts of great complexity have thus arisen, offering to him who can decipher their story clues as valuable for the construction of genealogical lines as have been found in the limb-bones of mammals or the hinge-teeth of bivalve mollusks." Attention has also been paid to the development of the gills, foot, and girille, "and for the first time systematic use has been made of the sense-organs of the shell (tegumentum), and the system of sculpture of the latter." It is curious that the radula, which, as a rule, furnishes such important ordinal characters among the Gastropoda, presents but very slight variations in the Chitons, and is of no assistance in the classification of the group.

The rest of the volume consists of detailed descriptions of the families, genera, and species, which are illustrated by sixty-eight carefully executed plates, giving figures, of which nearly three hundred are original, of the exterior of the shells, the disarticulated valves, showing the insertion-plates, slits, and sculpture.

One of the most radical changes in the classification proposed by Pilsbry is the abandonment of the groups of regular and irregular Chitons. He arranges them into three principal divisions, namely Eoplacophora, Mesoplacophora, and Teleoplacophora. In the first *the valves lack insertion-plates, or, if present, they are unslit*. In the second *all valves possess insertion-plates, but are without eyes; valves i., i.-vii., or i.-viii. have slits; teeth smooth or but slightly roughened between the slits, never closely, finely pectinated*. In the third *all valves, or valves i.-vii., possess insertion-plates cut into teeth by slits: the teeth are sharply sculptured or "pectinated" outside by fine vertical grooves*.

These three "superfamilies" are again subdivided into families, subfamilies, genera, and subgenera.

The study of the Chitons is an exceptionally complex one, and therefore, considering the rapidity with which the work has been produced and the newness of the subject to the author, Mr. Pilsbry is to be congratulated upon the result of his labours in the monograph before us. In conclusion, it is satisfactory to observe that this work has done good service in putting a definite specific value upon the large number of manuscript names proposed by Carpenter which have in the course of the last twenty years found their way into many collections throughout the world.

Life and Rock. By R. LYDEKKER, B.A., F.G.S., F.Z.S., &c.
8vo. London, 1894.

THIS popular exposition of facts and theories relative to some warm-blooded and some cold-blooded back-boned animals, and some few shells, insects, sea-urehins, and others, consists of various essays that have been already before the public in periodicals, and are now arranged in twenty-one chapters, with sixty-three illustrations. Elephants, moles, porcupines, whales, deer, sheep, lemurs, armadillos, crocodiles, some fishes, and other representative animals are